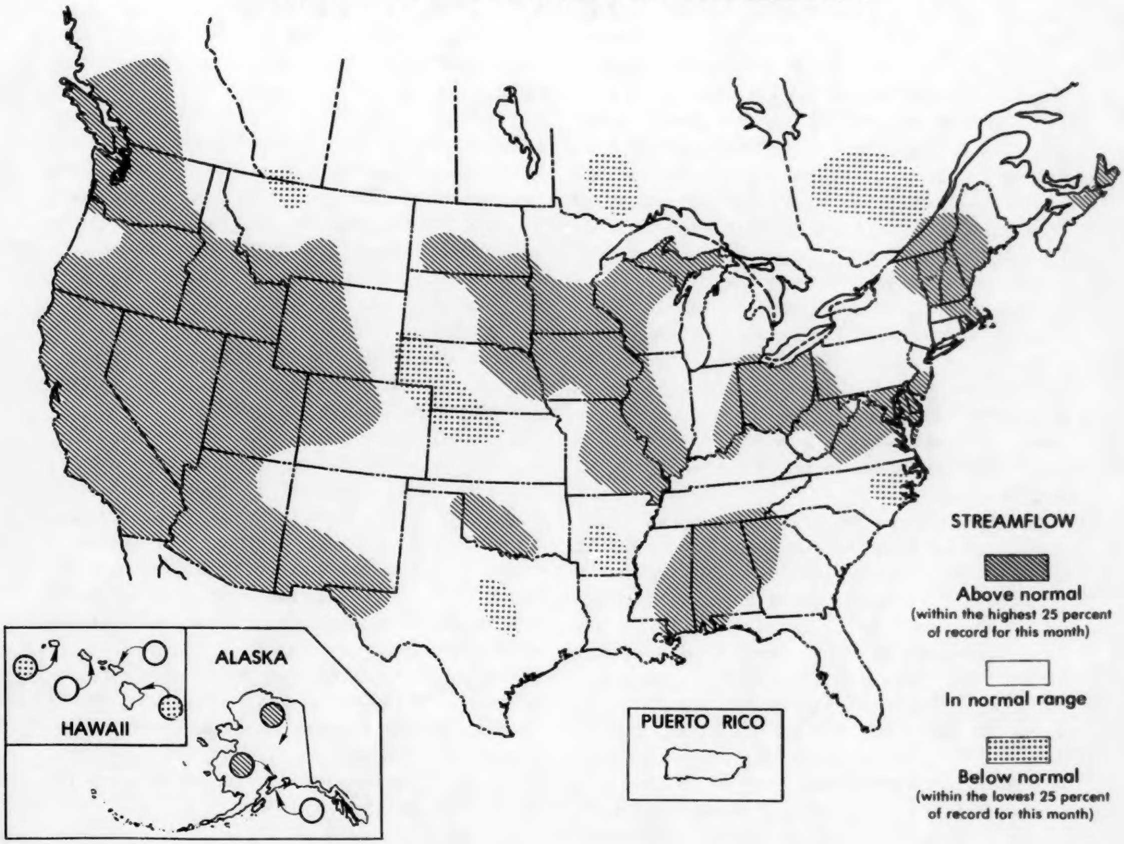
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

NOVEMBER 1983

STREAMFLOW DURING NOVEMBER



Streamflow was in the normal range or above that range in most of the United States and southern Canada during November. Below-normal streamflow persisted in parts of Ontario, Quebec, Arkansas, Kansas, Montana, North Carolina, and Texas. Monthly mean flows were highest of record for the month in parts of Alaska, Idaho, Missouri, Montana, Nevada, and Utah, and were lowest of record for November in western Kansas.

Severe flooding occurred in the southern part of the Kenai Peninsula in south-central Alaska at month's end. Flood stages, as designated by National Weather Service, were exceeded on numerous rivers and streams in the eastern half of the Nation and in the Far West during November.

STREAMFLOW CONDITIONS DURING NOVEMBER 1983

Streamflow generally increased seasonally in the Far West and in the eastern half of the Nation during November 1983. Monthly mean flows also increased in the Atlantic Provinces, Saskatchewan, Nebraska, and Kansas, and were variable elsewhere in the United States and southern Canada.

Monthly mean flows remained in the above-normal range in parts of most Western States, most north-central States, Virginia, Maryland, and Nova Scotia. Monthly and/or daily mean flows were highest of record for November in parts of Alaska, Idaho, Missouri, Montana, Nevada, and Utah, and were lowest of record in parts of Kansas. (See table on page 3.) The above-normal trend in streamflow continued in southern Arizona where monthly mean discharge of San Pedro River at Charleston decreased sharply to 229 percent of median, but remained in the above-normal range for the second consecutive month as a result of high carryover flow from October. (See graph on page 3.)

Flows remained in the below-normal range in parts of Ontario, Quebec, Arkansas, Kansas, Montana, North Carolina, and Texas, and decreased into that range in parts of Nebraska and Hawaii. In western Kansas, monthly mean flow of Saline River near Russell increased seasonally to 8 percent of median for November, remained in the below-normal range for the 7th consecutive month, and established a new record low for the 4th consecutive month.

In central Idaho, a major earthquake on October 28, 1983, caused a net increase in discharge from the Big Lost River basin, the long-term effects of which are not yet known. In northern Utah, the above-normal trend in streamflow was reflected in the elevation of Great Salt Lake, which was 4,205.30 feet above sea level on November 30, 1983. That level was 4.20 feet higher than a year ago, 0.30 feet higher than the peak elevation recorded during the 1983 water year, and the highest elevation since July 1, 1888. In New York, runoff from heavy rains late in the month boosted streamflow to above long-term medians at all index stations. In southern Indiana, runoff from moderate rains during the latter part of the month resulted in lowland flooding in the lower White and Wabash rivers. Similarly, moderate to heavy rainfall on November 25 caused sharp rises on small streams in North Carolina from the Piedmont to the mountains. In Alabama, monthly mean flows were above the normal range at all index stations because of runoff from much above-normal rain on November 23 and 27. Birmingham was placed under a flash flood warning by the National Weather Service as a result of 5 inches of rain on November 27. In Oklahoma, monthly mean flow of Washita River near Dickson remained in the above-normal range for the second consecutive month as a result of high carryover flow from October. In south-central Alaska, severe flooding occurred at month's end on the lower Kenai Peninsula as a result of runoff from intense rains, accompanied by melting of an early winter snowpack. The peak discharge of 4,400 cubic feet per second (cfs) on November 30, 1983 at Anchor River near Anchor Point (drainage area, 137 square miles) nearly equaled the maximum of record (14 years)—4,700 cfs on October 22, 1980. Preliminary analysis indicates that the recurrence interval of this flood exceeds 100 years. Damage to personal property and to the area's road system was greater than during the 1980 flood.

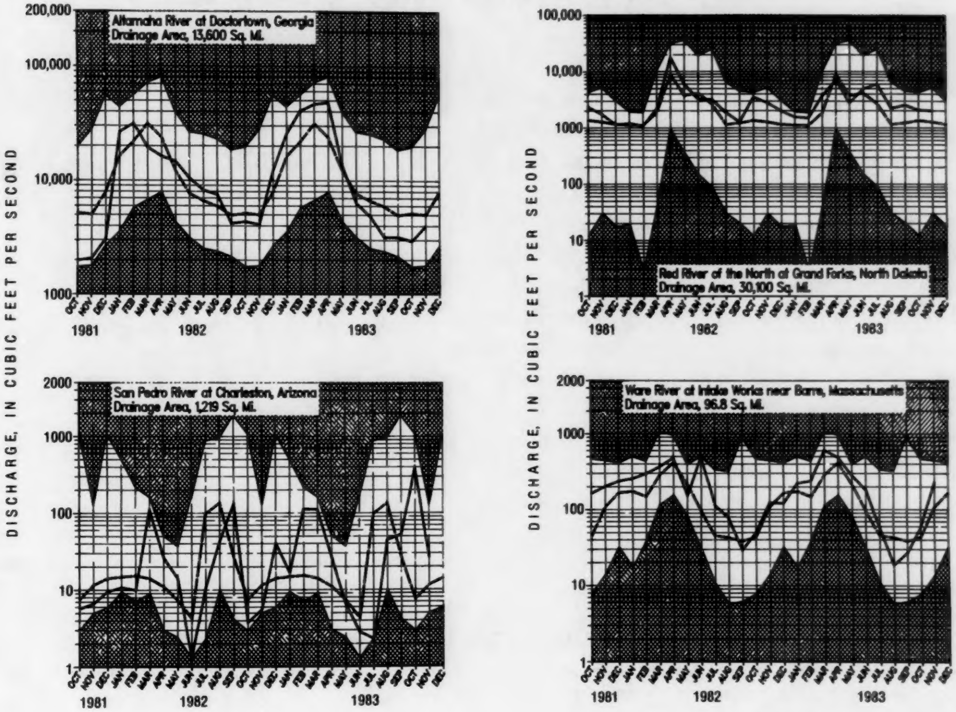
The above-normal trend in streamflow was reflected in the combined flow of three large rivers—Mississippi, St. Lawrence, and Columbia—which averaged 815,600 cfs during November, up 34 percent from last month and 22 percent above average for November. Because these three rivers account for streamflow runoff from more than half of the conterminous United States, their combined flow provides a useful check on the status of the Nation's water resources.

Near- or above-average contents characterized most reservoirs in the United States during November. Several key reservoirs in the Northeast were much below average, however, including the New York City reservoir system which was 32 percent below the long-term average for end of November.

CONTENTS

SURFACE WATER – MONTHLY MEAN DISCHARGE IN KEY STREAMS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period.



Provisional data, subject to revision

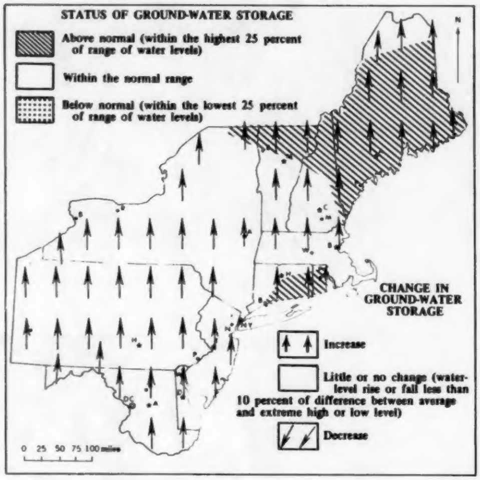
NEW EXTREMES DURING NOVEMBER 1983 AT STREAMFLOW INDEX STATIONS

Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous November extremes (period of record)		November 1983			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
				HIGH FLOWS					
06214500	Yellowstone River at Billings, Montana.	11,795	55	4,847 (1950)	7,470 (1974)	5,185	134	6,200	9
06933500	Gasconade River at Jerome, Missouri.	2,840	63	8,557 (1951)	35,300 (1973)	9,345	1,271	33,250	5
09180500	Colorado River near Cisco, Utah . .	24,100	72	5,685 (1970)	7,610 (1941)	5,702	158	6,320	20
10234500	Beaver River near Beaver, Utah . . .	91.0	69	33.6 (1927)	134 (1980)	45	261	58	28
10322500	Humboldt River at Palisade, Nevada.	5,010	76	189 (1941)	268 (1971)	410	621	515	25
13037500	Snake River near Heise, Idaho. . . .	5,752	73	5,010 (1927)	....	6,090	183	.....	...
13269000	Snake River at Weiser, Idaho	69,200	73	23,820 (1971)	31,300 (1927)	25,370	168	.....	...
13317000	Salmon River at Whitebird, Idaho. .	13,550	71	7,931 (1927)	17,100 (1973)	8,690	168	.....	...
15515500	Tanana River at Nenana, Alaska. . .	25,600	21	11,260 (1975)	14,000 (1975)	12,367	148	13,000	1-5
				LOW FLOWS					
06867000	Saline River near Russell, Kansas . .	1,502	32	2.97 (1978)	1.30 (1978)	1.80	8	1.50	1

GROUND-WATER CONDITIONS DURING NOVEMBER 1983

Ground-water levels rose seasonally in most of the Northeast Region. (See map.) Slight changes or declining levels occurred in some wells in the Adirondack, Catskill, and Long Island areas of New York and in southeastern Massachusetts. Levels near the end of the month were above average for November in several parts of New England, especially in Maine, northern New Hampshire, southeastern Connecticut, and southern Rhode Island. Elsewhere in the Northeast, levels were generally near average. Levels in several key observations wells in Maine and southern Connecticut were at or near the highest levels for November in the past 30 to 40 years.

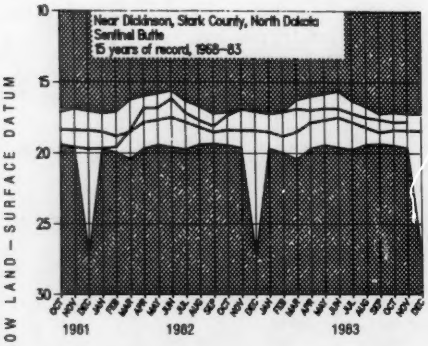
In the southeastern States, ground-water levels generally rose in Virginia, Arkansas, and Mississippi. Trends were mixed in other reporting States. Levels were above average in Kentucky, and below average in Virginia and Arkansas. Levels were above and below average in other States.

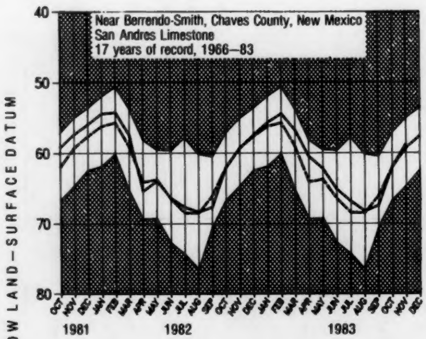


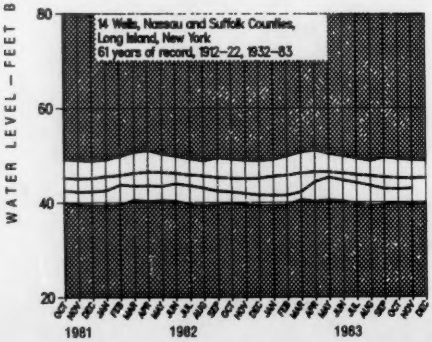
Map shows ground-water storage near end of November and change in ground-water storage from end of October to end of November.

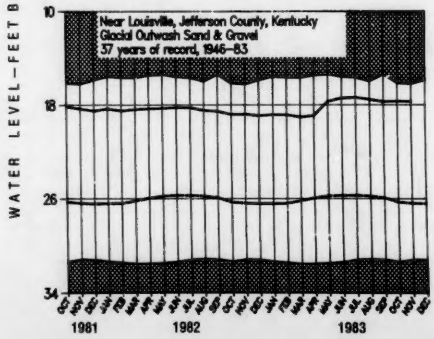
MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.









WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—NOVEMBER 1983

Aquifer and location	Water level in feet with reference to land-surface datum	Departure from average in feet	Net change in water level in feet since:		Year records began	Remarks
			Last month	Last year		
Glacial drift at Hanska, south-central Minnesota	-11.55	-3.19	+0.27	-7.64	1943	
Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan	-3.90	+1.02	-0.03	+0.49	1935	November high.
Glacial drift at Marion, Iowa	-3.94	+2.76	+1.46	-1.81	1941	
Glacial drift at Princeton in northwestern Illinois	-8.40	+5.80	+1.84	+0.08	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia	-17.16	-0.91	0	-0.88	1939	
Glacial outwash sand and gravel, Louisville, Kentucky (U.S. well no. 2)	-17.71	+8.25	-0.03	+1.07	1946	
500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2)	-103.58	-14.96	+0.05	-0.28	1941	
Granite in eastern Piedmont Province, Chapel Hill, North Carolina	-42.42	+1.07	-1.32	-0.46	1931	
Sparta Sand in Pine Bluff industrial area, Arkansas	-238.10	-34.24	+0.10	-8.10	1958	
Eutaw Formation in the City of Montgomery, Alabama (U.S. well no. 4)	-18.7	+4.4	-1.1	+3.6	1952	
Sand and gravel in Puget Trough, Tacoma, Washington	-101.93	+8.55	+9.25	+2.35	1952	
Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3)	-455.6	+4.9	-0.6	+2.4	1929	
Snake River Group: southwestern Snake River Plain aquifer, at Eden, Idaho	-121.3	-5.8	+0.2	+1.9	1957	
Flood plain alluvium at Hamilton Fairgrounds, Hamilton, Montana	-12.64	-0.65	-2.08	0	1970	
Alluvial sand and gravel, Platte River Valley, Nebraska (U.S. well no. 6)	-5.56	+0.78	+0.39	-1.36	1935	
Alluvial valley fill in Steptoe Valley, Nevada	-10.13	+3.30	+0.28	+0.81	1950	November high.
Pleistocene terrace deposits in Kansas River valley, at Lawrence, northeastern Kansas	-21.50	-0.60	+0.29	-0.72	1947	
Alluvium and Paso Robles, clay, sand, and gravel, Santa Maria Valley, California	-11.52	+26.24	-0.75	+22.95	1957	November high.
Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15)	-109.2	-30.85	+0.5	+3.6	1951	
Berrendo-Smith well in San Andres Limestone, Roswell artesian basin of Pecos Valley, New Mexico (U.S. well no. 1-A)	-58.74	+0.43	+3.21	+0.55	1966	
Hueco bolson, El Paso area, Texas	-260.06	-15.50	+0.98	-0.25	1965	November low.
Evangeline aquifer, Houston area, Texas	-311.35	-8.69	+5.60	+22.65	1965	

In the central and western Great Lakes States, ground-levels rose in Ohio and in most of Iowa, and generally declined in Wisconsin. Trends were mixed in Minnesota and Michigan. Levels were above average in Michigan and in most of Iowa, above or near average in Ohio, and near average in Wisconsin. Levels were mixed with respect to average in Minnesota. A new high ground-water level for November occurred in Michigan despite a slight net decline since the end of October.

In the Western States, ground-water levels rose in North Dakota, Nebraska, and Arizona. Trends were mixed in other States. Water levels were above average in Washington and Nebraska, and below average in Kansas and Arizona. Levels were mixed with respect to average in other States. A new alltime low level, in 40 years of record, occurred in New Mexico. New high levels for November were recorded in southern California, Nevada, and Utah, and a new low level for November occurred in Western Texas.

Provisional data; subject to revision

USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END NOVEMBER 1983

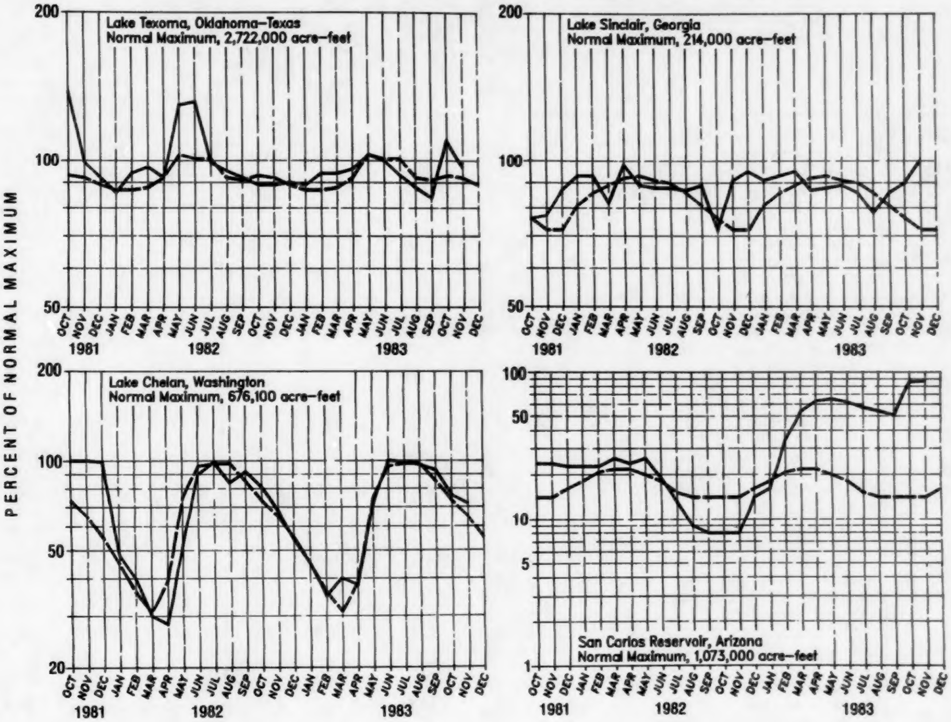
[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

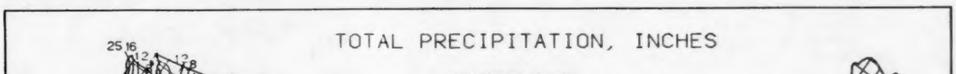
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum: End of Nov. 1983	End of Nov. 1982	Average for end of Nov.	End of Oct. 1983	Normal maximum (acre-feet)[a]
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs (P)	30	28	40	31	[b]226,300
QUEBEC					
Allard (P)	56	87	62	59	280,600
Gouin (P)	73	54	68	75	6,954,000
MAINE					
Seven reservoir systems (MP)	62	56	57	44	4,098,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	61	72	74	53	76,450
Lake Francis (FPR)	72	77	78	58	99,310
Lake Winnipesaukee (PR)	91	65	59	60	165,700
VERMONT					
Harriman (P)	66	65	64	56	116,200
Somerset (P)	51	65	71	41	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	69	73	72	62	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	52	46	56	49	786,700
Indian Lake (FMP)	77	65	60	74	103,300
New York City reservoir system (MW)	50	51	...	55	1,680,000
NEW JERSEY					
Wanaque (M)	76	66	65	63	85,100
PENNSYLVANIA					
Allegheny (FPR)	35	58	34	41	1,180,000
Pymatuning (FMR)	92	92	79	98	188,000
Raystown Lake (FR)	67	66	50	65	761,900
Lake Wallenpaupack (PR)	70	66	51	61	157,800
MARYLAND					
Baltimore municipal system (M)	86	65	83	82	261,900
NORTH CAROLINA					
Bridgewater (Lake James) (P)	94	92	77	91	288,800
Narrows (Badin Lake) (P)	95	95	92	76	128,900
High Rock Lake (P)	56	42	55	53	234,800
SOUTH CAROLINA					
Lake Murray (P)	76	83	60	72	1,614,000
Lakes Marion and Moultrie (P)	77	75	63	80	1,862,000
SOUTH CAROLINA--GEORGIA					
Clark Hill (FP)	57	61	51	59	1,730,000
GEORGIA					
Burton (PR)	86	92	58	92	104,000
Sinclair (MPR)	100	91	72	90	214,000
Lake Sidney Lanier (FMPR)	50	58	50	50	1,686,000
ALABAMA					
Lake Martin (P)	87	85	60	86	1,375,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	30	34	31	30	2,229,300
Douglas Lake (FPR)	23	26	18	27	1,394,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	52	49	42	45	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	37	46	35	40	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	43	50	41	46	1,478,000
WISCONSIN					
Chippewa and Flambeau (PR)	89	98	75	89	365,000
Wisconsin River (21 reservoirs) (PR)	90	95	65	90	399,000
MINNESOTA					
Mississippi River headwater system (FMR)	20	30	27	32	1,640,000
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	89	89	87	89	22,700,000
SOUTH DAKOTA					
Angostura (I)	74	87	73	72	127,600
Belle Fourche (I)	46	79	40	40	185,200
Lake Francis Case (FIP)	52	50	50	60	4,834,000
Lake Oahe (FIP)	85	86	...	88	22,530,000
Lake Sharpe (FIP)	99	100	95	101	1,725,000
Lewis and Clarke Lake (FIP)	94	96	92	93	477,000
NEBRASKA					
Lake McConaughy (IP)	91	80	67	87	1,948,000
OKLAHOMA					
Eufaula (FPR)	82	81	89	101	2,378,000
Keystone (FPR)	85	76	98	104	661,000
Tenkiller Ferry (FPR)	88	90	99	86	628,200
Lake Altus (FIMR)	41	55	45	48	133,000
Lake O'The Cherokees (FPR)	98	82	82	94	1,492,000
OKLAHOMA--TEXAS					
Lake Texoma (FMPRW)	97	89	92	110	2,722,000
TEXAS					
Bridgeport (IMW)	77	87	45	78	386,400
Canyon (FMR)	89	93	75	90	385,600
International Amistad (FIMPW)	77	88	88	76	3,497,000
International Falcon (FIMPW)	47	74	79	44	2,668,000
Livingston (IMW)	102	100	82	101	1,788,000
Possum Kingdom (IMPRW)	82	88	99	82	570,200
Red Bluff (PI)	13	15	28	12	307,000
Toledo Bend (P)	86	86	80	86	4,472,000
Twin Buttes (FIM)	22	37	32	22	177,800
Lake Kemp (IMW)	101	81	86	110	268,000
Lake Meredith (FWM)	44	50	38	45	796,900
Lake Travis (FIMPRW)	79	77	78	79	1,144,000
MONTANA					
Canyon Ferry (FIMPR)	93	91	90	95	2,043,000
Fort Peck (FPR)	88	86	85	87	18,910,000
Hungry Horse (FIPR)	84	97	84	84	3,451,000
WASHINGTON					
Ross (PR)	86	84	79	83	1,052,000
Franklin D. Roosevelt Lake (IP)	102	93	100	100	5,022,000
Lake Chelan (PR)	73	68	65	76	676,100
Lake Cushman (PR)	68	45	84	49	359,500
Lake Merwin (P)	100	100	91	101	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	71	71	53	62	1,235,000
Coeur d'Alene Lake (P)	85	41	53	62	238,500
Pend Oreille Lake (FP)	54	52	49	59	1,561,000
IDAHO--WYOMING					
Upper Snake River (8 reservoirs) (MP)	74	74	56	76	4,401,000
WYOMING					
Boysen (FIP)	81	93	80	88	802,000
Buffalo Bill (IP)	80	93	71	78	421,300
Keyhole (F)	26	30	44	26	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	71	54	46	69	3,056,000
COLORADO					
John Martin (FIR)	20	6	11	19	364,400
Taylor Park (IR)	62	69	53	65	106,200
Colorado–Big Thompson project (I)	83	56	55	55	722,600
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)	93	91	...	96	31,620,000
UTAH--IDAHO					
Bear Lake (IPR)	83	84	58	88	1,421,000
CALIFORNIA					
Folsom (FIP)	71	66	51	70	1,000,000
Hetch Hetchy (MP)	84	94	41	82	360,400
Isabella (FIR)	53	47	23	61	568,100
Pine Flat (FI)	75	72	41	79	1,001,000
Clair Engle Lake (Lewiston) (P)	85	82	70	85	2,438,000
Lake Almanor (P)	95	87	49	91	1,036,000
Lake Berryessa (FIMW)	92	90	74	90	1,600,000
Millerton Lake (FI)	66	71	40	61	503,200
Shasta Lake (FIPR)	79	76	64	78	4,377,000
CALIFORNIA--NEVADA					
Lake Tahoe (IPR)	95	85	46	84	744,600
NEVADA					
Rye Patch (I)	94	78	52	92	194,300
ARIZONA--NEVADA					
Lake Mead and Lake Mohave (FIMP)	94	90	69	95	27,970,000
ARIZONA					
San Carlos (IP)	87	8	14	86	1,073,000
Salt and Verde River system (IMPR)	80	66	37	80	2,019,100
NEW MEXICO					
Conchas (FIR)	68	72	79	68	330,100
Elephant Butte and Caballo (FIPR)	53	38	27	53	2,453,000

[a]1 acre-foot = 0.0436 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b]Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS, SEPTEMBER 1981 TO NOVEMBER 1983

Dashed line indicates average of month-end contents. Solid line indicates current period.





(From Weekly Weather and Crop Bulletin published by National Weather Service and Department of Agriculture.)

Provisional data; subject to revision

FLOW OF LARGE RIVERS DURING NOVEMBER 1983

Station number	Stream and place of determination	Drainage area (square miles)	Mean annual discharge through September 1980 (cubic feet per second)	November 1983					
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge, 1951–80	Change in discharge from previous month (percent)	Discharge near end of month		
							Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	11,312	160	+179	18,700	12,090	30
01318500	Hudson River at Hadley, N.Y	1,664	2,909	3,640	152	+203	5,000	3,200	30
01357500	Mohawk River at Cohoes, N.Y	3,456	5,734	3,340	70	+139	4,600	2,970	30
01463500	Delaware River at Trenton, N.J	6,780	11,750	7,956	81	+98	21,300	13,770	30
01570500	Susquehanna River at Harrisburg, Pa	24,100	34,530	16,800	68	+195	40,800	26,370	30
01646500	Potomac River near Washington, D.C.	11,560	[1]11,490	10,300	231	+89	22,600	14,610	30
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	2,000	103	+67	2,100	1,360	30
02131000	Pee Dee River at Peedee, S.C	8,830	9,851	3,920	87	+13	9,320	6,023	29
02226000	Altamaha River at Doctortown, Ga	13,600	13,880	4,016	80	+37	9,200	5,950	30
02320500	Suwannee River at Branford, Fla	7,880	6,987	3,410	102	-15	3,820	2,468	30
02358000	Apalachicola River at Chattahoochee, Fla	17,200	22,570	14,500	130	+13	26,400	17,060	29
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala	15,400	23,300	16,020	254	+494	69,400	44,850	30
02489500	Pearl River near Bogalusa, La	6,630	9,768	5,676	221	+105	15,600	10,080	30
03049500	Allegheny River at Natrona, Pa	11,410	[1]19,480	16,920	124	+211	18,200	11,760	28
03085000	Monongahela River at Braddock, Pa.	7,337	[1]12,510	12,160	157	+237	15,600	10,080	28
03193000	Kanawha River at Kanawha Falls, W. Va	8,367	12,590	10,240	130	+59	22,000	14,200	27
03234500	Scioto River at Higby, Ohio	5,131	4,547	5,949	366	+158	21,100	13,640	30
03294500	Ohio River at Louisville, Ky[2]	91,170	116,000	102,100	163	+51	109,600	70,840	27
03377500	Wabash River at Mount Carmel, Ill	28,635	27,220	15,529	141	+61	53,120	34,332	29
03469000	French Broad River below Douglas Dam, Tenn	4,543	6,798	3,470	74	+13	.....	.....	...
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis[2]	6,150	4,163	4,188	120	-1	5,210	3,367	24
04264331	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y[3]	299,000	242,700	269,800	109	-1	276,000	178,400	30
050115	St. Maurice River at Grand Mere, Quebec	16,300	25,150	11,900	66	-8	18,000	11,600	28
05082500	Red River of the North at Grand Forks, N. Dak	30,100	2,551	2,011	159	-2	1,300	840	28
05133500	Rainy River at Manitou Rapids, Minn.	19,400	12,830	13,800	141	-16	15,000	9,700	26
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	2,402	267	+49	3,860	2,494	27
05331000	Mississippi River at St. Paul, Minn	36,800	[1]10,610	11,953	190	+13	16,500	10,660	27
05365500	Chippewa River at Chippewa Falls, Wis.	5,600	5,100	8,622	223	+18	13,360	8,634	29
05407000	Wisconsin River at Muscoda, Wis	10,300	8,617	11,800	180	+19	24,890	16,086	30
05446500	Rock River near Joslin, Ill	9,551	5,873	4,920	130	+32	9,660	6,243	30
05474500	Mississippi River at Keokuk, Iowa	119,000	62,620	76,750	167	+12	126,400	81,690	30
06214500	Yellowstone River at Billings, Mont	11,796	7,038	5,185	134	-19	4,670	3,018	28
06934500	Missouri River at Hermann, Mo	524,200	79,490	103,300	189	+67	155,600	100,570	29
07289000	Mississippi River at Vicksburg, Miss[4]	1,140,500	576,600	414,500	138	+61	583,000	376,800	28
07331000	Washita River near Dickson, Okla.	7,202	1,368	1,838	475	-75	1,040	672	29
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex	9,730	725	293	70	+13	265	171	30
09315000	Green River at Green River, Utah.	40,600	6,298	6,149	222	-11	.....	.....	...
11425500	Sacramento River at Verona, Calif	21,257	18,820	38,963	299	+112	64,100	41,430	27
13269000	Snake River at Weiser, Idaho	69,200	18,050	25,370	168	+20	25,270	16,332	28
13317000	Salmon River at White Bird, Idaho	13,550	11,250	8,690	168	+35	7,720	4,989	28
13342500	Clearwater River at Spalding, Idaho	9,570	15,480	6,860	136	+49	13,000	8,400	28
14105700	Columbia River at The Dalles, Oreg[5]	237,000	193,100	131,300	150	+65	150,700	97,400	28
14191000	Willamette River at Salem, Oreg.	7,280	23,510	35,200	132	+643	56,500	36,520	28
15515500	Tanana River at Nenana, Alaska.	25,600	23,460	12,367	148	-35	12,000	7,800	30
8MF005	Fraser River at Hope, British Columbia	83,800	96,290	72,739	124	+40	52,965	34,232	29

[1]Adjusted.
[2]Records furnished by Corps of Engineers.
[3]Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4]Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5]Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

DISSOLVED SOLIDS AND WATER TEMPERATURES FOR NOVEMBER 1983 AT DOWNSTREAM SITES ON SIX LARGE RIVERS

Station number	Station name	November data of following calendar years	Stream discharge during month: Mean (cfs)	Dissolved-solids concentration during month[a]: Minimum (mg/L)	Dissolved-solids concentration during month[a]: Maximum (mg/L)	Dissolved-solids discharge during month[a]: Mean (tons per day)	Dissolved-solids discharge during month[a]: Minimum (tons per day)	Dissolved-solids discharge during month[a]: Maximum (tons per day)	Water temperature during month[b]: Mean in°C	Water temperature during month[b]: Minimum, in°C	Water temperature during month[b]: Maximum, in°C
	NORTHEAST										
01463500	Delaware River at	1983	7,956	83	124	2,163	1,083	4,904	9.0	7.0	11.0
	Trenton, N.J.	1945-82	10,000	55	151	.....	469	12,300	...	2.0	19.0
	(Morrisville, Pa.)	(Extreme yr)		(1955)	(1964)		(1963)	(1972)			
			[c]9,825								
04264331	St. Lawrence River at	1983	270,000	166	166	121,000	116,000	124,000	9.0	7.0	12.0
	Cornwall, Ontario, near	1975–82	282,600	162	169	127,000	106,000	137,000	8.5	4.5	12.0
	Massena, N.Y.	(Extreme yr)		(1980)	(1977)		(1978)	(1977)			
	median streamflow at		[c]248,300								
	Ogdensburg, N.Y.										
	SOUTHEAST										
0728900	Mississippi River at	1983	414,500	244	305	310,000	252,000	451,000	14.5	11.5	17.5
	Vicksburg, Miss.	1975–82	392,700	188	297	255,000	123,000	439,000	13.5	8.0	20.0
		(Extreme yr)		(1977)	(1981)		(1976)	(1977)			
			[c]320,600								
	WESTERN GREAT LAKES	*REGION*									
03612500	Ohio River at lock and dam	1983	*219,000	184	265	.....	855,000	229,000	...	12.0	16.5
	53, near Grand Chain, Ill.	1955–83	167,200	129	425	.....	27,200	406,000	...	1.0	19.5
	(25 miles west of Paducah,	(Extreme yr)		(1957)	(1968)		(1954)	(1957)			
	Ky.; streamflow station		[c]147,600								
	at Metropolis, Ill.)										
	MIDCONTINENT										
06934500	Missouri River at Hermann,	1983	**103,300	....	....	.....	.....	.....	...	...	...
	Mo. (60 miles west of St.	1975–82	74,500	225	506	80,900	43,600	156,000	9.0	3.5	15.0
	Louis, Mo.)	(Extreme yr)		(1977)	(1980)		(1976)	(1977)			
			[c]54,680								
	WEST										
14128910	Columbia River at	1983	141,000	100	120	41,900	30,800	61,900	12.0	10.0	14.5
	Warrendale, Oreg.	1975–82	129,800	38	128	35,300	10,800	66,400	11.0	6.0	14.5
	(streamflow station	(Extreme yr)		(1980)	(1978)		(1980)	(1978)			
	at The Dalles, Oreg.)		[c]87,960								

[a]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: [(1.8 X°C) + 32] = °F.
[c]Median of monthly values for 30-year reference period, water years 1951–80, for comparison with data for current month.
*Water-temperature extremes were taken from intermittent data.
**Data not available for November.

TRAVELTIMES OF FLOOD WAVES ON THE NEW RIVER BETWEEN HINTON AND HAWKS NEST, WEST VIRGINIA

The abstract and illustrations below are from the report, *Traveltimes of flood waves on the New River between Hinton and Hawks Nest, West Virginia*, by D. H. Appel, U.S. Geological Survey Water Supply Paper 2225, 14 pages, 1983. This report may be purchased for $2.75 from Eastern Distribution Branch, Text Products Section, U.S. Geological Survey, 604 S. Pickett St., Alexandria, VA 22304 (check or money order payable to U.S. Geological Survey); or from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 (payable to Superintendent of Documents).

ABSTRACT

The New River Gorge National River's [a 51-mile segment of the New River between Hinton and Fayette (an abandoned community), W.Va.] main attraction is a combination of scenic wilderness, fishing, cultural resources, and whitewater boating. (See figure 1.) However, recreational quality, safety, and use of the river depends in part upon the amount and fluctuations in streamflow, manmade and natural. During 1981 and 1982, the U.S. Geological Survey found that the flood wave travels at an average speed of 6.8 miles per hour when streamflow is 15,000 cubic feet per second and 3.5 miles per hour when streamflow is 2,200 cubic feet per second. Curves have been developed to estimate traveltimes between any two points within the National River jurisdiction. (See figure 2.)

The gaging station at Thurmond, installed as part of this study, can be called by telephone, (304) 465-0493, to determine river stage. The river stage can be converted to streamflow and traveltimes.

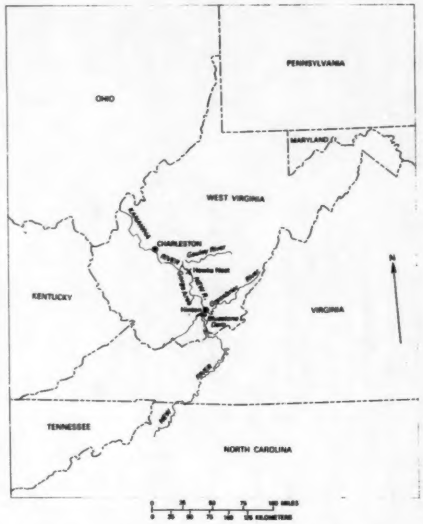


Figure 1.—General location of the New River.

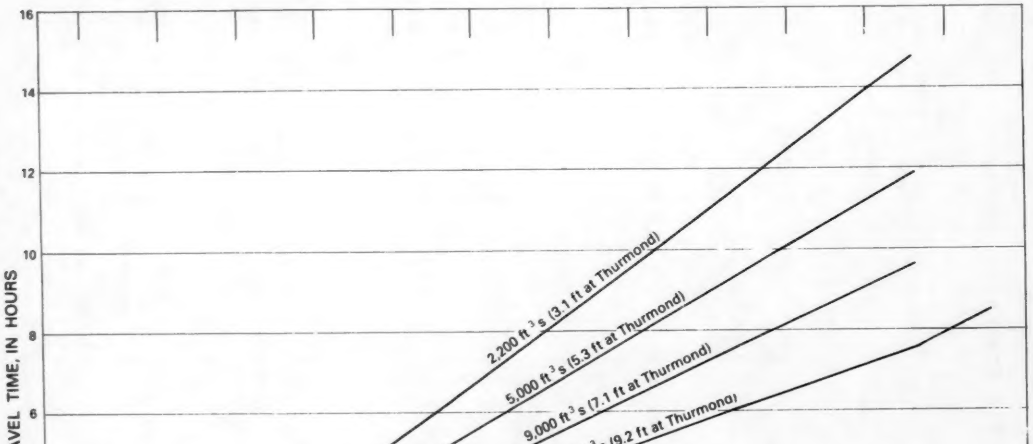


Figure 2.—Traveltimes of flood waves at selected streamflows (and stages) in the New River between Hinton and Hawks Nest.

NATIONAL WATER CONDITIONS

November 1983

Based on reports from the Canadian and U.S. field offices; completed December 12, 1983

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The National Water Conditions is published monthly. Subscriptions are free on application to the National Water Conditions, U.S. Geological Survey, MS 420, Reston, Virginia 22092.

EXPLANATION OF DATA

Cover map shows generalized pattern of streamflow for the month based on 18 index stream-gaging stations in Canada and 164 index stations in the United States. Alaska and Hawaii inset maps show streamflow only at the index gaging stations that are located near the points shown by the arrows.

Streamflow for the current month is compared with flow for the same month in the 30-year reference period, 1951–80. Streamflow is considered to be *below the normal range* if it is within the range of the low flows that have occurred 25 percent of the time (below the lower quartile) during the reference period. Flow is considered to be *above the normal range* if it is within the range of the high flows that have occurred 25 percent of the time (above the upper quartile). Shorter reference periods are used for the Puerto Rico index stations because of the limited records available.

Flow higher than the lower quartile but lower than the upper quartile is described as being *within the normal range*. In the National Water Conditions, the median is obtained by ranking the 30 flows for each month of the reference period in their order of magnitude; the highest flow is number 1, the lowest flow is number 30, and the average of the 15th and 16th highest flows is the median. One-half of the time you would expect the flows for the month to be below the median and one-half of the time to be above the median.

Statements about *ground-water levels* refer to conditions near the end of the month. The water level in each key observation well is compared with average level for the end of the month determined from the entire past record for that well or from a 30-year reference period, 1951–80. *Changes in ground-water levels*, unless described otherwise, are from the end of the previous month to the end of the current month.

Dissolved solids and temperature data for November are given for six stream-sampling sites that are part of the National Stream Quality Accounting Network (NASQAN). Dissolved solids are minerals dissolved in water and usually consist predominantly of silica and ions of calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, and nitrate. Dissolved-solids discharge represents the total daily amount of dissolved minerals carried by the stream. Dissolved-solids *concentrations* are generally higher during periods of low streamflow, but the highest dissolved-solids *discharges* occur during periods of high streamflow because the total quantities of water, and therefore total load of dissolved minerals, are so much greater than at time of low flow.

METRIC EQUIVALENTS OF UNITS USED IN THE NATIONAL WATER CONDITIONS

1 foot = 0.3048 meter

1 acre-foot = 1,233 cubic meters

1 million cubic feet = 28,320 cubic meters

1 cubic foot per second =
0.02832 cubic meters per second =
1.699 cubic meters per minute

1 cubic foot per second · day = 2,447 cubic meters

1 mile = 1.609 kilometers

1 square mile = 259 hectares = 2.59 square kilometers

1 million gallons = 3,785 cubic meters =
3.785 million liters

1 million gallons per day = 694.4 gallons per minute =
2.629 cubic meters per minute =
3,785 cubic meters per day

(Round-number conversions, to nearest four significant figures)

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